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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,729	11/06/2000	Yoshinori Shizuno	OKI 267	7911
23995	7590	12/19/2003	EXAMINER	
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			FARAHANI, DANA	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 12/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/705,729	SHIZUNO, YOSHINORI	
	Examiner	Art Unit	
	Dana Farahani	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/19/02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Marrs et al., hereinafter Marrs (U.S. Patent 5,583,378), previously cited.

Marrs discloses in figure 2A, a semiconductor device comprising a semiconductor chip 202; metal thin wires 222 are respectively connected to electrodes on the semiconductor chip; a wiring board 214 having an opening for accommodating the semiconductor chip and the board is connected to the chip by the wires; a heat spreader 204 having a flat principle surface, and having the chip and the wiring board on the surface; a common adhesive layer, 210 and 206, in direct physical contact with and which is provided over the principle surface of the heat spreader and is in direct physical contact with both the chip and the wiring board to the heat spreader; and an encapsulating resin 226 sealing the metal thin wires, wherein the chip is disposed in the opening of the wiring board, and is separated from the edges of the wiring board that collectively define the opening by a space so that the chip does not completely cover the heat spreader with the opening, and a portion of the heat spreader within the opening that is not covered by the chip is covered by the adhesive layer.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs, as applied to claim 1 above, and further in view of Yamagata et al., hereinafter Yamagata (U.S. 5,828,127), previously cited.

Marrs discloses the claimed invention, as discussed above, except for a second adhesive layer and a radiating fin.

Yamagata discloses in figure 13, adhesive 20 and fin 19 to improve heat releasing capability (see column 19, lines 31-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this structure in Marrs invention in order to further improve heat dissipation capability in the device of Marrs invention, and further use a second adhesive layer as the material for the layer 230A of Marrs structure, with the same thermal characteristic as the first adhesive layer, since the adhesive would have been readily available (it was used to form the first adhesive layer).

5. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs in view of Yamagata, as applied to claim 2 above, and further in view of Shin (U.S. Patent 5,807,768), previously cited.

Yamagata, as applied to Marrs, renders obvious the claimed invention, as discussed above, Marrs further disclosing in figure 2K a second adhesive 206, which is encapsulated with resin 226. However, Marrs does not disclose sealing the metal thin wires with a second different encapsulating resin after a first encapsulating resin, which seals the chip, has been cured.

Shin discloses in figure 2 a first encapsulate 6a, and a second encapsulate 7a, sealing the metal wires, are provided for the chip package in the figure. Furthermore, Shin discloses the first encapsulate is cured before the second one is added (see column 5, lines 8-10; and column 10, lines 29-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two encapsulates in order to attach the chip to the heat sink firmly, with a first stronger encapsulate than the second encapsulate to be disposed on the wires, without affecting the wires. Although, the process step order is not thought by the references, as claim 5 recites, an order of sequence can not be considered as an act of invention, and the sequence of ordering of a process step is held to render prima facie obvious. *Ex Parte Rubin* 126 USPQ 440 (BAP1 1959).

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marrs in view of Yamagata, and further in view of Shin, and further in view of Ross (U.S. Patent 5,572,070), previously cited.

Marrs in view of Yamagata and Shin renders obvious the claimed invention, as discussed above, except for disclosing the resin has been partially cured.

Ross discloses at column 4, lines 10-19 a partially cured resin remains non-flowing. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to only partially cure the resin in the Shin reference in order to be able to have flexibility in adding and measuring the desired amount of resin in the structure of the reference.

Response to Arguments

7. Applicant's arguments filed 10/31/03 have been fully considered but they are not persuasive.

Applicant argues that in claim 1, a common adhesive layer is provided, in direct contact with and over the principle surface of the heat spreader and is in direct contact with chip and wiring board. Note that in figure 2k adhesives that numbered as 206 and 210 are both adhesives in direct contact with each other, and therefore, indistinguishable. In another words, both the adhesives could be said to be one adhesive layer, as a whole. For example, as an analogy, if in a silicon substrate more silicon is added into the substrate, essentially the added silicon functions as part of the silicon that was originally in the substrate and therefore, is not a separate layer. Obviously, this is true if the added silicon is in direct contact with the silicon that originally was in the substrate, not if there is any intervening layer between the original silicon and the added silicon. This is the case here, that is adhesives 206 and 210 are in direct contact with each other.

With regard to applicant argument that the cited reference does not disclose that a portion of the thermal conductor 204 that is not covered by the chip is covered by the adhesive layer, note that the opposite is true, as can clearly be seen in figure 2K (adhesive 210 covers the whole surface of 204).

With regard to applicant's argument that the case law, cited above, should not have been cited to reject the order of steps recited in claim 5, note that one within the level of ordinary skill in the art would have motivated to change the order of the process steps, for example, to have greater flexibility to control the physical location of the wires and electrode.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

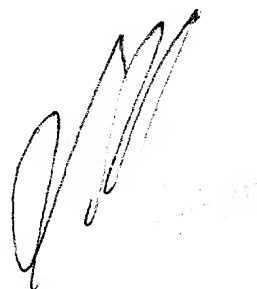
Art Unit: 2814

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703)308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D. Farahani
12/12/2003

A handwritten signature in black ink, appearing to be 'D. Farahani', located at the bottom right of the page.